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THE USE OF OIL AS FUEL.

The full report of the tests made under the auspices of the United States navy to determine the relative efficiency of coal and crude petroleum as fuel has just appeared in print. An inquiry equally thorough has never before been made in this country, and much of the information secured will be servicable to railroad companies, owners of merchant steamers, and persons who meditate the establishment of power plants either for the generation of electricity or for manufacturing purposes. The relative merits of a variety of burners were also examined by the government, and the results obtained increase the practical value of the report.

The experiments were made with a water tube boiler of the kind which has been adopted for cruisers of the Denver class. Coal was used in 17 and oil in 69. The average amount of water evaporated by a pound of coal was nine pounds, while 12 1/2 pounds were evaporated by the same quantity of petroleum. Weight for weight, then, the latter showed a superiority of about 40 per cent. It should be added that Pocahontas coal and Beaumont oil were employed in these tests. Had either the solid or liquid fuel been of another quality, of course the ratio would have been different.

In determining which is the more economical it is necessary to consider not merely the price at the place of production, but also the cost of transportation to the place of consumption. The Atchison, Topeka & Santa Fe Railway Company once operated 25 freight engines continuously for a month with coal costing \$6.65 a ton, and then for another month with petroleum which was bought at \$1.33 a barrel. It was found that three and one-half barrels of the latter (involving an expenditure of \$4.67) would do the work of a ton of the former. By the use of oil, a saving of 38 per cent was effected. In California and New Mexico the difference would probably be even more conspicuous, whereas in the north Atlantic states coal is at present the cheaper.

In a number of ways the convenience which has attended the use of the liquid fuel on locomotives would be paralleled in the navy. A fresh supply can be taken into the tanks of an engine or a ship with great ease. Consumption can be readily adjusted to meet the fluctuations in the demand for steam. There is no trouble in forcing a fire in emergencies, and it is alleged that higher speed can be maintained with oil than with coal. On the other hand, there are some questions have not yet been satisfactorily solved, and which need further study before liquid fuel can be heartily commended for the naval service. There is much uncertainty at present about securing a supply on short notice. Under forced draught combustion is imperfect, and smoke is emitted. The difficulty can be remedied by allowing more space for the boilers, but without such a change of design the detection of a vessel—a small and defenceless destroyer, for instance—would be possible. Still another modification in the arrangement of a warship is demanded. If an enemy's shot goes through coal bunkers their contents are unharmed. Puncture an oil tank, and the effect would be more serious. It is highly desirable that liquid fuel be stored at a lower level than coal.

The merchant marine could disregard the last two, perhaps all, of these objections, comments the New York Tribune. A vessel engaged in peaceful pursuits would be in little danger of having her sides pierced by a cannon ball, and would be still less embarrassed by a display of smoke. Moreover, one running regularly between certain ports—say San Francisco and Yokohama—would enjoy better facilities for obtaining liquid fuel than a warship, which is practically a tramp. Already in the east several steamship lines rely exclusively on oil, and it is hard to see why there should not be a great extension of its use in the trans-Pacific trade. California should be able to meet requirements of this kind promptly and adequately.

IRRIGATION IN THE WEST.

The progress made in irrigation and reclamation of arid lands in the west is far in excess of the extent generally known to the public, says the Cincinnati Commercial Tribune. The latest statistics of work being done show the employment of 700

men on the Salt river reservoir in Arizona, with 2000 to be employed when the blasting now in process has been completed. To the Snake river valley in Idaho the sum of \$2,600,000 has been allotted and the area to be irrigated exceeds 150,000 acres. The dam across the valley will form a reservoir 35 miles in length.

The Milk river irrigation scheme in Montana involves the expenditure of \$5,000,000, and 350,000 acres will be irrigated. Work is to be resumed and pushed on the Gunnison tunnel, in the Uncompahgre valley, Colorado, with a capacity for irrigating 135,000 acres. Secretary Hitchcock has approved the plans and specifications for a dam across the Payette river in Idaho, forming a reservoir with an irrigating capacity of 190,000 acres. The north side canal, along Payette river, will have an irrigating capacity of 150,000 acres, and the cost of the entire work is estimated at \$3,000,000.

In addition to the work now in progress in Idaho, Arizona, Colorado and Montana, Secretary Hitchcock has ordered a survey of the Sun river valley in Montana. This scheme involves the reclamation of the enormous body of land lying between the Teton and Sun rivers, while contracts have been let for the construction of the dam for the irrigation of lands in the Pecos valley, New Mexico.

The work under way, or under contract, involves the reclamation of not less than 7,225,000 acres of land now arid and not susceptible of cultivation but to be made so, and to be thrown open to settlers at the usual rates within the next three years, neither the lands in the Pecos valley nor between the Sun and Teton rivers being included in the estimate.

The value of the work cannot be overestimated. While the actual cost of irrigation will exceed the sum to be received for the lands, the values added to the total wealth of the United States by making farm lands out of deserts, and creating flourishing communities where there are now only waste lands, will be immeasurably greater than any sums the United States may expend on the work. The magnificent results accomplished, and to be accomplished, come from the earnestness of President Roosevelt in bringing the matter to the attention of congress and in urging the question until the needed legislation was enacted.

Russia has in round numbers 5,000,000 Jews, Austria-Hungary comes next with 2,000,000, the United States comes in third with a little over 1,000,000, Germany, Turkey and Great Britain have about 1,000,000 altogether, France, with her African possessions, has a few more than 200,000, and even far-off Abyssinia has something like an equal number. The census of Jews in the world is set down as 10,671,832 in the Jewish year book, which may be accepted as the highest authority on the subject, and near enough to accuracy for all political and statistical purposes.

"Electricity" says that plans are being made in the bureau of forestry to establish wireless stations at intervals throughout the Rocky mountain region where there are large forests and where fires occur in the dry season every year, destroying an immense amount of timber. At these stations will be kept expert observers, who will give warning whenever a fire begins, so that help may be called to extinguish it. The first system to be set in operation will be in the Black hills.

It is stated that Senator Elkins is to take only a thinking part in the West Virginia campaign. It is a wise man who declines to hold a joint debate with a wealthy father-in-law.

J. Pierpont Morgan refers to the accident in which he recently had a narrow escape as one to be expected in railroading occasionally. Mr. Morgan has seen too many railroads wrecked to be disturbed by a minor incident.

It is not necessary for a modern woman to feel that she cannot live without a man in order to marry him. The only question is to know if she can possibly live with him.

Three thousand love letters, it has been stated, are to be read in an Iowa breach of promise case. Is there no law for the prevention of cruelty to jurors?

Some men and some women get their complexions out a bottle; the difference is in internal and external application.

A Kansas man has invented a featherless chicken. We hope it will become popular in restaurants.

William Waldorf Astor does not think well of this country. But, for that matter, he never did.

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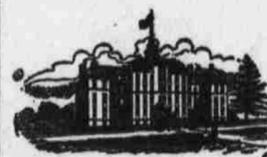
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